

Abstract

A grating or grism element for use with a line-narrowing package of an excimer or molecular fluorine laser includes a highly reflective (HR) and/or an anti-reflective (AR) dielectric coating. The grating may also serve as a resonator reflector, thus having a dielectric HR coating. The grating may be disposed in front of an HR mirror and thus have a dielectric AR coating. The grating may be used as an output coupler and thus be partially reflective with or without a coating. The grism has a dielectric AR coating on any transmissive surface and a dielectric HR coating on any reflective surface. The grism may be configured to be disposed in the laser resonator with the grating surface facing the discharge chamber and serving as a HR reflecting resonator reflector. The prism portion may face the discharge chamber and the grating portion serving as a HR reflecting resonator reflector. The grating surface may face the discharge chamber and the rear surface of the prism portion may serve as a HR reflecting resonator reflector. The grism may be disposed in front of a HR resonator reflecting mirror or partially reflecting outcoupling mirror. The grism may serve as an output coupling element with either the grating surface or prism portion facing the discharge chamber, and, in either case, either the grating surface or prism portion serving as a partially reflecting resonator reflector surface. In this case, the surface that serves as the partially reflecting resonator reflector surface is partially reflecting and may be uncoated or coated, while the other surface has a dielectric AR coating on it. The grism may be disposed at a selected orientation with respect to the longitudinal cross-section of the resonator, such that the prism portion of the grism may serve as a beam expanding prism.